OIPE APR 13 2005 PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Hoppensteadt et al. :

Serial No.: 09/771,019 : Examiner: Hirl, Joseph P.

Filing Date: January 26, 2001 : Art Unit: 2121

For: **Phase-locked Loop Oscillatory Neurocomputer**

CERTIFICATE OF MAILING BY EXPRESS MAIL
"Express Mail" Mail Label Number EV604503509US

Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I hereby certify that the following correspondence is being deposited in the United States Postal Service as Express Mail on today's date in an envelope addressed as shown above:

1. Petition to the Commissioner Under 37 C.F.R. § 1.59(b) to Withdraw and Expunge Improper "Supplemental Reasons for Allowance" (4 pages);
2. Tab A "Notice of Allowance and Fees Due" (8 pages);
3. Tab B "Supplemental Reasons for Allowance" (8 pages); and
4. A return receipt postcard.

on the date shown below:

April 15, 2005
Date

Suzie Shields

Gallagher & Kennedy, P.A.
2575 East Camelback Road
Phoenix, AZ 85016-9225
Tel. No. (602) 530-8088
Fax No. (602) 530-8500

1142239v5

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Hoppensteadt et al. :

Serial No.: 09/771,019 : Examiner: Hirl, Joseph P.

Filed: January 26, 2001 : Group Art Unit: 2121

TITLE: **Phase-locked Loop Oscillatory Neurocomputer**

PETITION TO THE COMMISSIONER UNDER 37 C.F.R. § 1.59(b) TO WITHDRAW AND EXPUNGE IMPROPER "SUPPLEMENTAL REASONS FOR ALLOWANCE"

Mail Stop Petition
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is applicant's Petition to have withdrawn and expunged from this application's record the Supplemental Reasons for Allowance issued after the issue fee had been paid. The Supplemental Reasons for Allowance inappropriately comment on the allowed claims, attempt to narrow the allowed claims by reading into them specific features mentioned in the specification and the abstract and illustrated in the drawings. The Supplemental Reasons for Allowance violate the Patent and Trademark Office's standard of claim interpretation, are in violation of the Rules of Practice, and place a cloud on the interpretation of the claims in this application.

On October 14, 2004 the Patent and Trademark Office issued a Notice of Allowance, Notice of Allowability and Reasons for Allowance in the application identified above. These are attached at tab A. The Reasons for Allowance included the usual instruction that any comments should be filed no later than payment of the issue fee.

Payment of the issue fee was due no later than January 14, 2005. The issue fee was paid January 10, 2005. Applicant submitted no comments on the Reasons for Allowance.

On February 24, 2005 "Supplemental Reasons for Allowance" were issued by the Office. These are attached at tab B. Interpreting claims 18 and 20, the examiner contends, incorrectly, that the claim term "neural network computer" is defined in the abstract:

Applicant defines "neural network computer" in the abstract as follows:

A neural network computer (20) includes a weighting network (21) coupled to a plurality of phase-locked loop circuits (25_1-25_N). The weighting network (21) has a plurality of weighting circuits (C_{11},...,C_{NN}) having output terminals connected to a plurality of adder circuits (31, -31_N). A single weighting element (C_{kj}) typically has a plurality of output terminals coupled to a corresponding adder circuit (31_k). Each adder circuit (31_k) is coupled to a corresponding bandpass filter circuit: (35_k) which is in turn coupled to a corresponding phase-locked loop circuit (25_k). The weighting elements (C_{11}, ..., C_{NN}) are programmed with connection strengths, wherein the connection strengths have phase-encoded weights. The phase relationships are used to recognize an incoming pattern.

The "Supplemental Reasons for Allowance" go on to say that the claims import not just the above-quoted Abstract content, but all of the features of Fig. 1 of the drawings and the description of Fig. 1 at pages 3 and 4 of the specification:

Figure 1 attached is the associated schematic diagram for neural network computer (20). Fig. 1 is further defined on page 4 and 5 of the specification. Applicant's statement "using a phase deviation between signals representing a learned pattern and signals representing the incoming pattern" can only infer an oscillatory neural network computer. Further, from specification at p. 4, l 13-15, the output signals $V(\theta_1)$, $V(\theta_2)$, ... $V(\theta_{N-1})$, $V(\theta_N)$ have equal frequencies and constant, but not necessarily zero, phase relationships. Hence, claim 18, carries all of the limitations of Fig. 1 (PLL are neurons) which include the abstract and the detailed description of pages 3 and 4 of the specification.

The case law and the Office's own Manual of Patent Examining Procedure (M.P.E.P.) are clear that "During patent examination, the pending claims must be given [their] broadest reasonable interpretation consistent with the specification." M.P.E.P. § 2111, p. 2100-46 (Rev. 1, Feb. 2003), citing *In re Hyatt*, 211 F. 3d 1367, 1372, 54 USPQ2d 1664 (Fed. Cir. 2000). Accord, *In re Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004).

At Section 2111.01, the M.P.E.P. expresses how the terms of the claims "must" be interpreted:

While the ** claims of <u>issued</u> patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims must be interpreted as broadly as their terms reasonably allow. This means that the words of the claim must be given their plain meaning unless applicant has provided a clear definition in the specification. *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) (discussed below)>; *MSM Investments Co. v. Carolwood Corp.*, 259 F.3d 1335, 1339-40, 59 USPQ2d 1856, 1859-60 (Fed. Cir. 2001). (Emphasis original.)

Manual of Patent Examining Procedure, § 2111.01, p. 2100-47 (Rev. 1, Feb. 2003).

The plain meaning of the words of a claim is the meaning that would be understood by one skilled in the art:

When not defined by applicant in the specification, the words of a claim must be given their plain meaning. In other words, they must be read as they would be interpreted by those of ordinary skill in the art.> *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342, 60 USPQ2d 1851, 1854 (Fed. Cir. 2001) (explaining the court's analytical process for determining the meaning of disputed claim terms); *Toro Co. v. White Consol. Indus., Inc.*, 199 F.3d 1295, 1299, 53 USPQ2d 1065, 1067 (Fed. Cir. 1999) ("[W]ords in patent claims are given their ordinary meaning in the usage of the field of the invention, unless the text of the patent makes clear that a word was used with a special meaning.").

Manual of Patent Examining Procedure, § 2111.01, p. 2100-48 (Rev. 1, Feb. 2003). There is nothing in the present application to suggest a special meaning for the terms of the claims and they should be understood as one ordinarily skilled in the art would understand them, not by the importation of unclaimed language and features from the drawings and the specification.

The Abstract statement quoted by the examiner is not a definition. The Abstract is not a part of the specification of the application, and the Abstract cannot be used to impart a definition to a claim term.

Use of the Abstract to interpret a claim is in violation of the Office's Rules of Practice, 37 C.F.R. 1.72(b):

***The purpose of the abstract is to enable the United States Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. The abstract will not be used for interpreting the scope of the claims.

The Abstract does not "define" claim terms, it is a guide to the technical content of the patent disclosure. Per 37 C.F.R. 1.72(b) it is not available for use in interpreting the claims.

For all of the above reasons, the "Supplemental Reasons for Allowance" issued after closure of examination are improper, are contrary to the Office's practice and rules, and should be withdrawn and expunged. Such action is now respectfully requested.
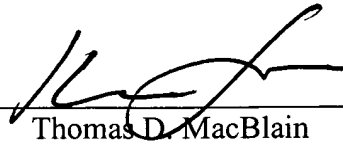
Respectfully submitted,

GALLAGHER & KENNEDY, P.A.

Date: 4/15/2005

By _____
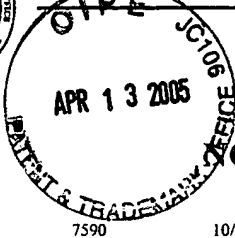Thomas D. MacBlain
Reg. No. 24,583
Kaare D. Larson
Reg. No. 51,920
Attorneys for Applicant

Gallagher & Kennedy
2575 East Camelback Road
Phoenix, AZ 85016
(602) 530-8088
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UNITED STATES PATENT AND TRADEMARK OFFICE

APR 1 3 2005

NOTICE OF ALLOWANCE AND FEE(S) DUE

EXAMINER	
HIRL, JOSEPH P	

ART UNIT	PAPER NUMBER
2121	

7590   10/14/2004

Thomas D. MacBlain
GALLAGHER & KENNEDY
2575 East Camelback Road
Phoenix, AZ 85016

DATE MAILED: 10/14/2004

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/771,019	01/26/2001	Frank C. Hoppensteadt	9138-23	6361

TITLE OF INVENTION: PHASE-LOCKED LOOP OSCILLATORY NEUROCOMPUTER

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	~~NO~~ yes	~~$1370~~ $700	$0	~~$1370~~ $700	01/14/2005

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

Page 1 of 4

PTOL-85 (Rev. 09/04) Approved for use through 04/30/2007.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail**

Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

or **Fax** (703) 746-4000

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

7590   10/14/2004

Thomas D. MacBlain
GALLAGHER & KENNEDY
2575 East Camelback Road
Phoenix, AZ 85016

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (703) 746-4000, on the date indicated below.

_____ (Depositor's name)

_____ (Signature)

_____ (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/771,019	01/26/2001	Frank C. Hoppensteadt	9138-23	6361

TITLE OF INVENTION: PHASE-LOCKED LOOP OSCILLATORY NEUROCOMPUTER

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	~~NO~~ yes	~~$1370~~ $700	$0	~~$1370~~ $700	01/14/2005

EXAMINER	ART UNIT	CLASS-SUBCLASS
HIRL, JOSEPH P	2121	706-038000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Gallagher & Kennedy, P.A.

2 Thomas D. MacBlain

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

Arizona Board of Regents

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Tempe, Arizona

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are enclosed:

☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s):

☒ A check in the amount of the fee(s) is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized by charge the required fee(s), or credit any overpayment, to Deposit Account Number 070135 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

☒ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.   ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

The Director of the USPTO is requested to apply the Issue Fee and Publication Fee (if any) or to re-apply any previously paid issue fee to the application identified above.
NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____   Date 1/10/2005
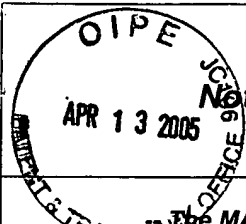
Typed or printed name Kaare P. Larson   Registration No. 51,920

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PTOL-85 (Rev. 09/04) Approved for use through 04/30/2007.   OMB 0651-0033   U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *July 21, 2004*.

2. ☒ The allowed claim(s) is/are *1-35*.

3. ☒ The drawings filed on *26 January 2001* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of
    Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 072404

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☐ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

100604

Reasons for Allowance

1.   Claims 1-35 are allowed.

2.   The following is an examiner's statement of reasons for allowance:

The cited prior art taken alone or in combination fails to teach the claims

invention of a weighting network that includes weighting circuits, adder circuits and

bandpass filter circuits serially coupled in a feedback configuration to a plurality of

phase-locked circuits (Applicant's Fig. 1) with inputs provided to the adder circuits and

outputs established from the weight circuits which represents a fully recurrent neural

network resulting in a dynamic response that has the capability of recognizing

(classifying) signals. Further, such a recurrent neural network is simulated

(programmed) by modeling the connection coefficients (weights) as a function of phase

relationships of a designated pattern. Similarly, a phase differential is established

between a trained pattern and an unknown to create a classified output.

The closest prior art (Ahissar, U.S. Patent 6,581,046) teaches a phase detector

and a controllable local oscillator that are connected in a negative feedback loop where

the output is fed back to the local oscillator to phase lock the input (Ahissar, Fig. 2A).

The circuit implementation is different and the function of specific rate encoding of

Ahissar represents a different implemented algorithm (function) from that of the

applicant 's pattern recognition. The applicant's oscillator neural network computer

achieves the capabilities of a fully recurrent neural network providing pattern

recognition.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Correspondence Information

Any inquiry concerning this information or related to the subject disclosure should be directed to the Examiner, Joseph P. Hirl, whose telephone number is (703) 305-1668. The Examiner can be reached on Monday – Thursday from 6:00 a.m. to 4:30 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Anthony Knight can be reached at (703) 308-3179. Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

or faxed to:

(703) 746-7239 (for formal communications intended for entry);

or faxed to:
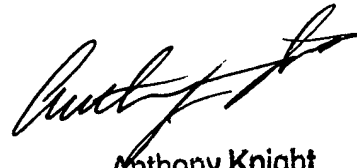
(703) 746-7290 (for informal or draft communications with notation of "Proposed" or "Draft" for the desk of the Examiner).

Note: During the last two weeks of October 2004, Art Unit 2121 will move to

Carlyle, Randolph Building, 5th floor and my phone and fax number will change to: 571-

272-3685 and 571-273-3685, respectively. Similarly, Anthony Knight's phone and fax

numbers will change to: 571-272-3687 and 571-273-3687.

Joseph P. Hirl   Anthony Knight
                                        Supervisory Patent Examiner
October 6, 2004   Group 3600

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Complete if Known	
Application Number	09/771,019
Filing Date	January 26, 2001
First Named Inventor	Hoppensteadt et al.
Art Unit	2121
Examiner Name	Hirl, Joseph P.

RECEIVED
JUL 2 6 2004
Technology Center 2100

Sheet	1	of	1	Attorney Docket Number	9138-0023US
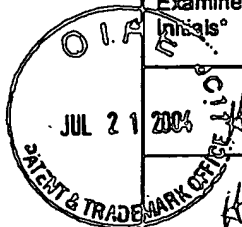
NON PATENT LITERATURE DOCUMENTS

Examiner Initials°	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	1.	F. C. HOPPENSTEADT, E. IZHIKEVICH, "Canonical Models for Bifurcations from Equilibrium in Weakly Connected Neural Networks," WCNN'95, Washington, D.C., Vol. 1, pp. 180-183.	
	2.	F. C. HOPPENSTEADT, E. M. IZHIKEVICH, "Synaptic Organizations and Dynamical Properties of Weakly Connected Neural Oscillators," Biol. Cybern. 75, 117-127 (1996).	
	3.	F. C. HOPPENSTEADT, E. M. IZHIKEVICH, "Synaptic Organizations and Dynamical Properties of Weakly Connected Neural Oscillators," Biol. Cybern. 75, 129-135 (1996).	
	4.	E. Ahissar, "Temporal-Code to Rate-Code Conversion by Neuronal Phase-Locked Loops," Neural Computation 10, 597-650 (1998).	

Examiner Signature		Date Considered	10/6/4

UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/771,019	01/26/2001	Frank C. Hoppensteadt	9138-23	6361

7590   10/14/2004

Thomas D. MacBlain
GALLAGHER & KENNEDY
2575 East Camelback Road
Phoenix, AZ 85016

EXAMINER
HIRL, JOSEPH P

| ART UNIT	PAPER NUMBER
2121	

DATE MAILED: 10/14/2004

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 391 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 391 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (703) 305-1383. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at (703) 305-8283.

PTOL-85 (Rev. 09/04) Approved for use through 04/30/2007.
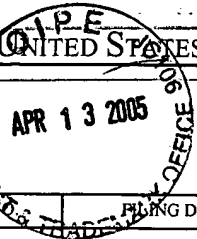
UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/771,019	01/26/2001	Frank C. Hoppensteadt	9138-23	6361

7590   02/24/2005

Thomas D. MacBlain
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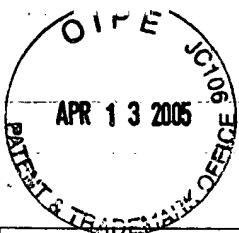2575 East Camelback Road
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EXAMINER
HIRL, JOSEPH P

ART UNIT	PAPER NUMBER
2121	

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PTO-90C (Rev. 10/03)

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
09/771, 019	01/26/2001	FRANK C. HOPPENSTEADT	9138-23

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ART UNIT	PAPER
2121	20050222

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Enclosed are Supplemental Reasons for Allowance

Commissioner for Patents

Supplemental Reasons for Allowance

1.   The following is an examiner's statement of reasons for allowance for claims 18

and 20:

> Applicant states claim 18 (claim 20 is similar in concept) as follows:
>
> A method for recognizing an incoming pattern using a neural network computer comprising using
> a phase deviation between signals representing a learned pattern and signals representing the
> incoming pattern to create an output signal indicative of the learned pattern.

> Applicant defines "neural network computer" in the abstract as follows:
>
> A neural network computer (20) includes a weighting network (21) coupled to a plurality of
> phase-locked loop circuits (25_1-25_N). The weighting network (21) has a plurality of weighting
> circuits (C_{11}, ..., C_{NN}) having output terminals connected to a plurality of adder circuits (31_1-31_N).
> A single weighting element (C_{kj}) typically has a plurality of output terminals coupled to a
> corresponding adder circuit (31_k). Each adder circuit (31_k) is coupled to a corresponding
> bandpass filter circuit: (35_k) which is in turn coupled to a corresponding phase-locked loop circuit
> (25_k). The weighting elements (C_{11}, ..., C_{NN}) are programmed with connection strengths, wherein
> the connection strengths have phase-encoded weights. The phase relationships are used to
> recognize an incoming pattern.

Figure 1 attached is the associated schematic diagram for neural network

computer (20). Fig. 1 is further defined on page 4 and 5 of the specification.

Applicant's statement "using a phase deviation between signals representing a learned

pattern and signals representing the incoming pattern" can only infer an oscillatory

neural network computer. Further, from specification at p 4, l 13-15, the output signals

$V(\theta_1)$, $V(\theta_2)$, ... $V(\theta_{N-1})$, $V(\theta_N)$ have equal frequencies and constant, but not necessarily

zero, phase relationships. Hence, claim 18, carries all of the limitations of Fig. 1 (PLL

are neurons) which include the abstract and the detailed description of pages 3 and 4 of

the specification.

The closest prior art (Ahissar, U.S. Patent 6,581,046) teaches a neuronal

phased-locked loop (NPLL) that can decode temporally-encoded information and

convert it to a rate code based on an algorithm similar to that of the electronic PLL albeit

a stochastic device, implemented by neural networks. The NPLL consists of a rate

control oscillator (RCO) and a phase detector (PD). From Ahissar at c 5, l 8-27:

> The RCO is a local oscillator whose output frequency (and thus, the timing of its output spikes) is controlled by the firing rate of its input; if the input is zero, the RCO will fire at its intrinsic frequency. The more excitatory the input, the higher the RCO's output frequency and the more inhibitory the input, the lower is the RCO's frequency. The PD compares the phase (i.e., the time-of-arrival) of each of the spikes of a repetitive input against the phase of the RCO spikes and produces an output that is a "measure" of (i.e., its firing rate is proportional to) the phase difference. The RCO can be regarded as a rate-to-temporal code converter and the PD as a temporal-to-rate converter. The PD's output (R_d) is fed into the RCO's input and changes the RCO's firing phase in the direction that will cancel the phase difference (in fact, cancel any deviation from some constant phase difference; see below), i.e., establishing a negative feedback loop (Appendix A.2). Note that in the following description `phase difference` and `temporal difference` are interchangeable terms, both expressed in time units.

Ahissar changes frequency to represent input features. Applicant requires that

frequency remains constant. If Ahissar maintained a constant frequency, Ahissar's

invention simply would not functionally represent input features.

Concerning the alternative prior art of Kurokawa et al (A Local Connected Neural

Oscillator Network for Sequence Character Segmentation), Fig. 1 identifies a two

neuron oscillatory neural network and Fig. 4 expands the model to an N x M neural

oscillatory network. Kurokawa, p 840, c 1, l 1-10 states:

> In Fig. 4, open and filled circle indicate neural oscillator. The filled circle oscillator does not have plastic synapse and never change its way of oscillation. It only gives a target oscillation to other oscillators. On the other hand, each oscillator which is indicated by open circle has plastic feedback synapse and the learning is possible. In short, the learning is applied to open circle oscillator to synchronize with the filled circle oscillator.

Applicant's neural network computer described above and illustrated in the related Fig.1 of applicant's disclosure requires a feedback from each PLL (neuron) to the input of each neuron in the network. Applicant also imposes the requirement that all neurons feedback to all neurons.   Kurokawa has local connection feedback only (Kurokawa, p 839, c 2, l 32; p 840, c 1, l 1). If a requirement for total feedback (from all neurons to all neurons) is imposed on the prior art of Kurokawa, wherein each oscillator is required to have plasticity, Kurokawa's network will fail to function. Specifically, Kurokawa's eqn (4) on page 839 will have a reference without network control. φ_l , solid circle oscillator reference, will function unintelligently since all oscillators have a feedback (T) including the reference and then φ_l is either nonexistent or varying in a nonstandard way. In either case, Kurokawa's neural oscillator network will fail to realize sequential character segmentation.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Correspondence Information

Any inquiry concerning this information or related to the subject disclosure

should be directed to the Examiner, Joseph P. Hirl, whose telephone number is

(571) 272-3685. The Examiner can be reached on Monday – Thursday from

6:00 a.m. to 4:30 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the

Examiner's supervisor, Anthony Knight can be reached at (571) 272-3687.

Any response to this office action should be mailed to:

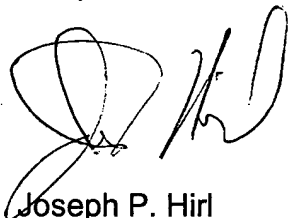Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

or faxed to:

(703) 872-9306 (for formal communications intended for entry);

or faxed to:

(571) 273-3685 (for informal or draft communications with notation of

"Proposed" or "Draft" for the desk of the Examiner).

Joseph P. Hirl

February 22, 2005
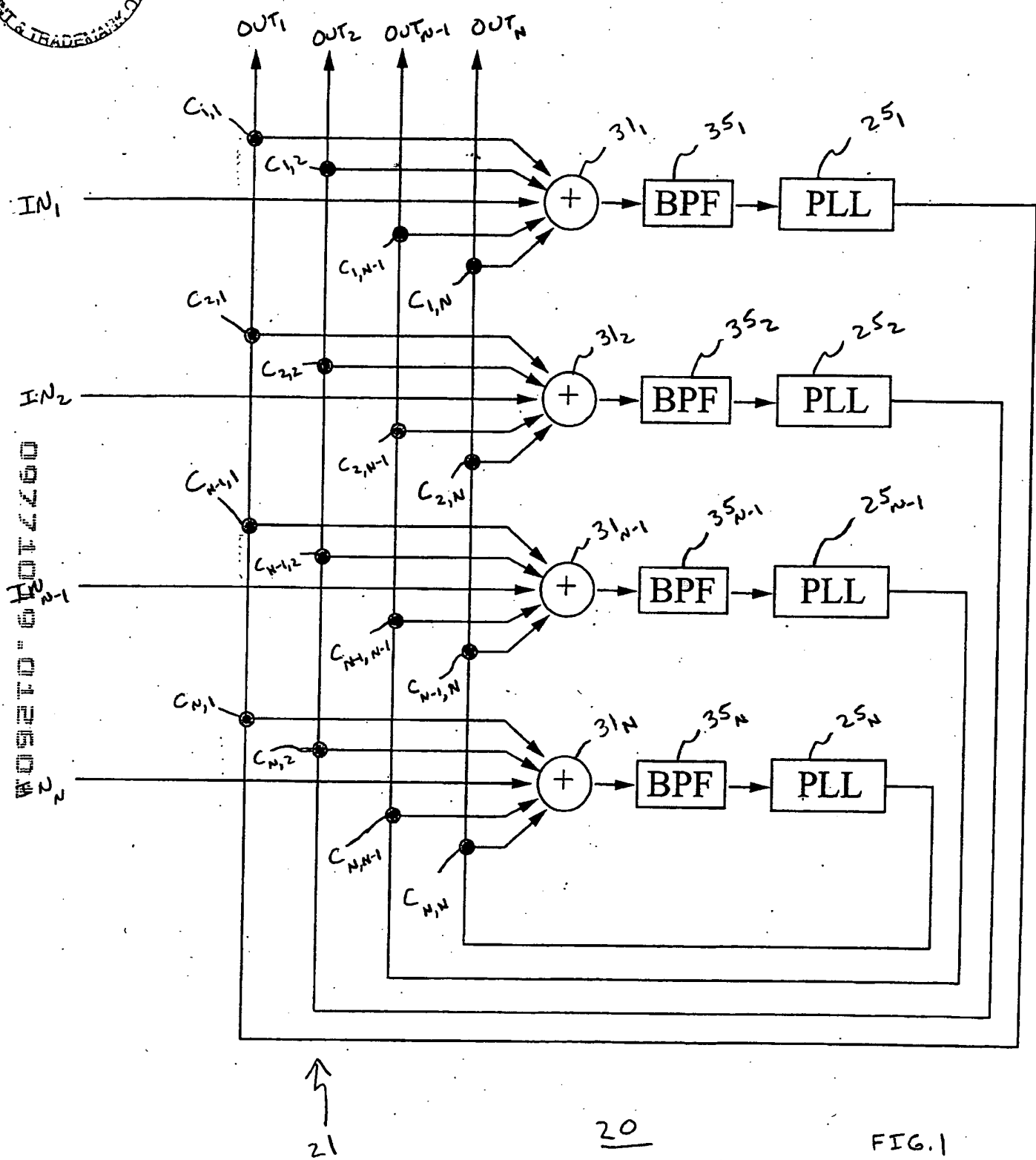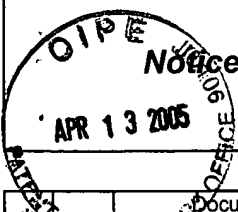
FIG.1

Hoppensteadt et. al.

60/178,640

		Application/Control No.	Applicant(s)/Patent Under Reexamination
Notice of References Cited		09/771,019	HOPPENSTEADT ET AL.
		Examiner	Art Unit	
		Joseph P. Hirl	2121	Page 1 of 1

U.S. PATENT DOCUMENTS

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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Hiroaki Kurokawa, A Local Connected Neural Oscillator Network for Sequential Character Segmentation, June 1997, IEEE, 0-7803-4122-8/97, 838-843
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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